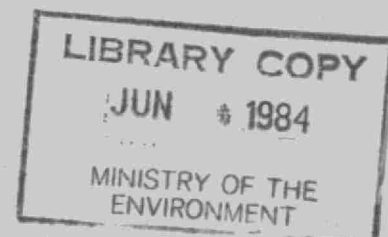


Ontario. Ministry of the  
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Preliminary Investigation of the  
Decline of White Birch Trees in the

Wawa Area

Progress Report No. 1

July, 1983

Investigator in Charge

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Plant Pathologist

NER-AQTM-02-84

## Introduction

Over the past several years, it has been noted by staff of the Ontario Ministry of the Environment that extensive areas of white birch trees in the Wawa area were suffering severe dieback symptoms. It is not known when the condition first developed but it has apparently been present for some time. The situation probably has been poorly defined since at some points, it borders on areas historically subjected to damage from the iron ore sintering plant at Wawa. To determine whether or not the sinter plant could be implicated in the poor condition of the trees, a preliminary investigation of the decline of white birch trees in the Wawa area was initiated on July 20, 1983. This report summarizes the data obtained in that investigation.

## Methods

Five sites were selected along Highway 17 as shown in Figure 1. At each site, 10 white birch trees were selected for increment coring and the crown condition, diameter and other features recorded. Tree crowns were rated according to the Hawbolt classification system for hardwoods where a healthy tree is rated as "1" while a dead tree is rated as "6". At Site 4, two trees in each crown class were selected whereas at the other sites, trees were chosen to be representative of the area. Each sampled tree was identified with a numbered tag for possible future evaluation.

In addition to the above tree sampling and evaluations, two lines each 50 meters long and two meters wide were established perpendicular to Highway 17 originating at the highway allowance. The species and diameter of each tree falling within this strip were recorded. These data were collected in an attempt to document the type of forest present on the site.

At each of the five sites, the tree, shrub and herb species were recorded as present or absent. Samples of representative soils and white birch roots were collected for analysis at each site.

### Data

All data collected during this investigation are summarized in the attached tables. Birch trees at Sites 1 and 2 were larger than at the other sites (Table 1). Decline symptoms were prevalent with 33 of 50 trees rated in crown classes 3, 4 and 5 (Table 2). Twelve trees were recorded as having splits, seams or cracks in the trunk. The cause or consequence of this condition are presently not known.

The tree species encountered in the two strip plots showed similar total numbers (Table 3). Similar numbers and sizes of white birch trees were present. The major differences between the sites were more numerous and smaller white spruce and mountain maples at Site 2 whereas the balsam fir were smaller and more numerous at Site 1.

The vegetation species list shows white birch, balsam fir, white spruce and mountain ash to be present at all sites while white cedar was present at three sites (Table 4). Mountain maple was present at all sites while raspberry, pin cherry and skunk currant were recorded at four sites. A total of 15 shrub species were noted among all sites.

Herbaceous species varied among the sites however *Clintonia*, *Aralia nudicaulis* and ferns were seen at all sites (Table 5). A total of 23 herb species were recorded.

## Conclusions

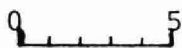
At present it is not possible to draw any conclusions with regards to the birch dieback syndrome other than to note that it is highly prevalent in the area south of Wawa along Highway 17 into Lake Superior Provincial Park. Detailed examination of the increment cores collected during this study and other investigations are required. Weather records etc. will also be required to assess the role of environmental factors.

## Future Work

The Ministry of Natural Resources completed a tree growth study in the Wawa area in 1983 and have gathered data on some of the white birch that are of interest to us. Although their study had a different purpose, their raw data could be of use to us. This aspect is currently being examined. Depending upon demands from the District Offices of M.O.E., we will continue to collect relevant data in an attempt to document the extent, severity and cause of the dieback problem.

Figure 1

Scale: km



Plot 5

Plot 4

Gros Cap  
Indian  
Reserve

Wawa

101

Lake Superior

Plot 1

Plot 2

Plot 3

17

White Birch Decline Study  
Site in the Wawa Area 1983

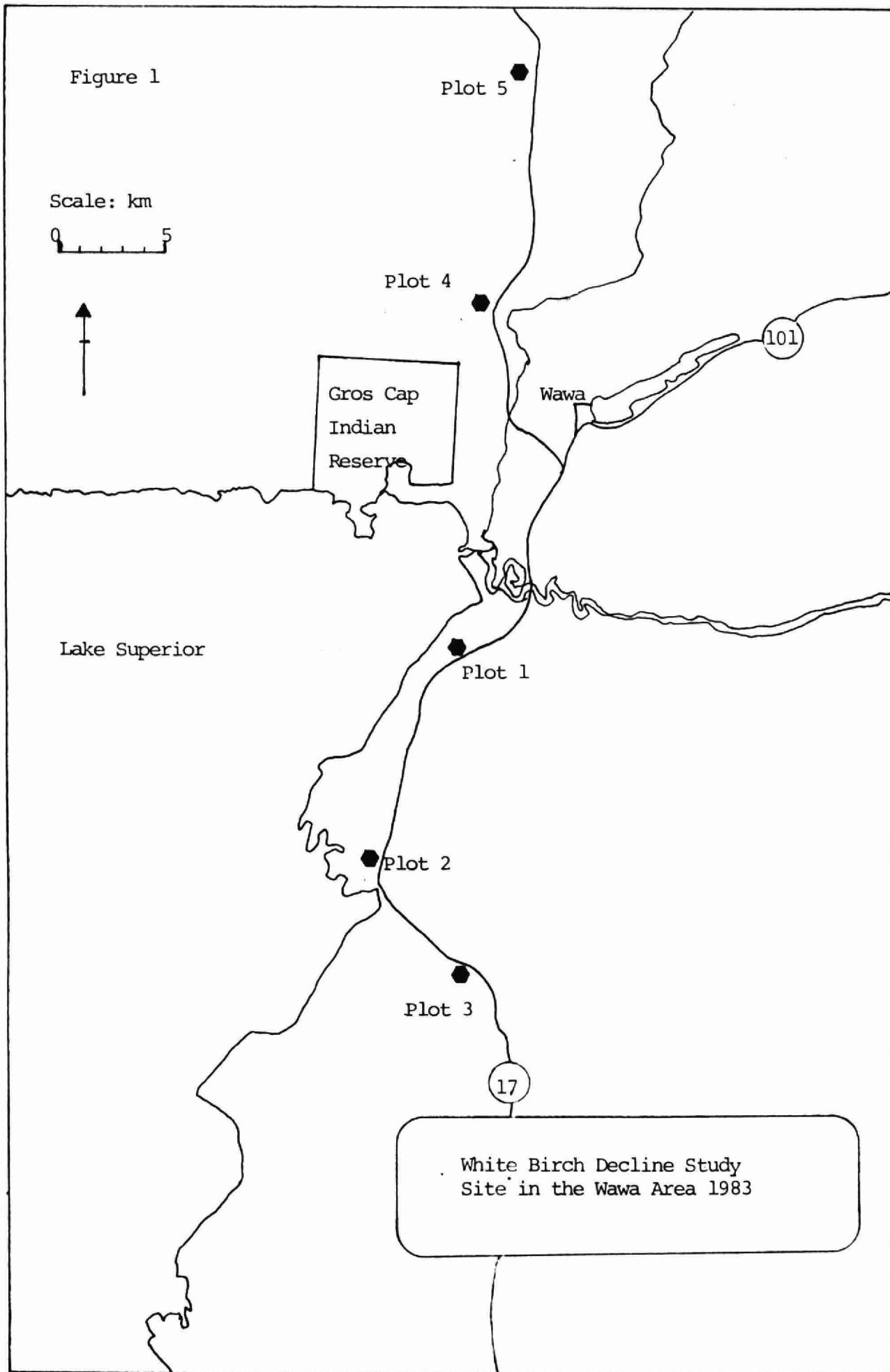


Table 1: Evaluation of trees sampled at White Birch Study Sites, Wawa area, July, 1983.

Site #1

Tree #	Diameter	Crown Condition	Remarks
401	32.1 cm	1	no dieback
402	30.0	3	moderate dieback
403	44.2	2	very light dieback
404	36.3	4	severe dieback
405	35.3	3	crack in bark
406	33.4	3	light moderate dieback
407	36.0	4	moderate dieback
408	47.7	3	light dieback
409	36.0	3	light dieback
410	34.0	4	moderate dieback
Mean	36.5		

Site #2

Tree #	Diameter	Crown Condition	Remarks
411	32.7 cm	3	split
412	35.9	4	moderate dieback
413	35.7	5	severe dieback
414	27.5	2	light dieback, split
415	36.4	3	light dieback, bark seam
416	42.5	5	severe dieback, bark seam
417	37.1	4	moderate dieback
418	46.8	3	light-moderate dieback, split
419	29.6	3	light dieback
420	36.3	3	light dieback
Mean	36.1		



Table 1 (cont'd): Evaluation of trees sampled at White Birch Study Sites,  
Wawa area, July, 1983.

Site #3

Tree #	Diameter	Crown Condition	Remarks
421	24.3 cm	2	light dieback
422	22.3	3	light-moderate dieback
423	18.0	2	trace-light dieback
424	20.0	2	light dieback
425	20.2	2	recent light dieback
426	20.7	1	
427	27.5	1	crown thin
428	25.4	1	
429	20.8	1	
430	22.2	2	trace-light dieback
Mean	22.1		

Site #4

Tree #	Diameter	Crown Condition	Remarks
431	35.8 cm	1	
432	29.9	1	
433	29.4	2	
434	28.1	3	
435	25.6	3	
436	30.4	4	
437	28.7	2	
438	22.8	5	
439	24.1	5	
440	20.2	4	
Mean	27.5		

Table 1 (cont'd): Evaluation of trees sampled at White Birch Study Sites,  
Wawa area, July, 1983.

Site #5

Tree #	Diameter	Crown Condition	Remarks
441	32.4 cm	3	cracked bark
442	48.8	3	cracked bark
443	21.3	5	
444	27.0	4	
445	26.0	3	
446	29.9	2	cracked bark
447	23.3	3	
448	23.8	4	cracked bark
449	20.8	3	
450	28.4	3	cracked bark
Mean	28.2		

Table 2: Distribution of Crown Class Ratings of sampled trees at White Birch Study Sites in the Wawa area, July, 1983.

Site	Crown Class				
	1	2	3	4	5
Site 1	1	1	5	3	0
Site 2	0	1	5	2	2
Site 3	4	5	1	0	0
Site 4	2	2	2	2	2
Site 5	0	1	6	2	1
	7	10	19	9	5

Table 3: Distribution of tree and shrub species in a 50 meter strip  
at two White Birch Study Sites, July, 1983.

Species	Site 1		Site 2	
	#Trees	Mean Diameter	#Trees	Mean Diameter
White Birch	6	17.2	7	19.6
Balsam Fir	10	8.4	3	16.1
White Spruce	1	24.8	7	6.3
White Cedar	3	24.5	2	27.3
Mountain Ash	2	9.3	0	-
Mountain Maple	1	7.5	7	4.3
Pin Cherry	1	8.1	0	-
Total	24	*19.4	26	12.1

\*Overall Mean for all trees

Table 4: Presence of tree and shrub species at White Birch Study Sites, Wawa area, July, 1983.

	Site				
	1	2	3	4	5
White Birch	X	X	X	X	X
Balsam Fir	X	X	X	X	X
White Spruce	X	X	X	X	X
White Cedar	X	X			X
Mountain Ash	X	X	X	X	X
Sugar Maple			X		
Yew		X		X	X
Raspberry		X	X	X	X
Mountain Maple	X	X	X	X	X
Pin Cherry	X		X	X	X
Beaked Hazel			X	X	X
Speckled Alder	X				
Skunk Currant	X	X	X	X	
Bush Honeysuckle	X	X		X	
Red Ozier Dogwood		X			
Willow sp.			X		
Fly Honeysuckle			X		
Serviceberry			X	X	
Elderberry			X		
Blueberry				X	
Highbush Cranberry	X				

Table 5: Presence of herbaceous woodland plant species at White Birch Study Sites, Wawa area, July, 1983.

Species	Site				
	1	2	3	4	5
Large-Leaved Aster	X	X			
Clintonia	X	X	X	X	X
Maianthemum	X	X	X		X
Starflower	X			X	X
Oxalis	X	X			
Rosy Twisted Stalk	X	X			
Bunchberry	X			X	X
Aralia nudicaulis	X	X	X	X	X
Indian Pipe	X				X
Bedstraw	X				
Red Dog Bone	X				
Meadowrue		X			
Violet		X	X		
Joe Pyeweed		X			
Trillium		X			
Jewelweed		X			
Enchanters Nightshade		X			
Solomons Seal		X	X		
Sedge					
Pearly Everlasting					X
Sheep Sorrel					X
Fern	X	X	X	X	X
Clubmoss		X	X		

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